



07-05-05

IMAGE IFU

2124

PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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**TRANSMITTAL
FORM**

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

98

Application Number

09/826,118

Filing Date

01/09/2001

First Named Inventor

Urbain A. von der Embse

Art Unit

2124

Examiner Name

Chat C. Do

Attorney Docket Number

ENCLOSURES (Check all that apply)

Fee Transmittal Form



Fee Attached



Amendment/Reply



After Final



Affidavits/declaration(s)



Extension of Time Request



Express Abandonment Request



Information Disclosure Statement



Certified Copy of Priority Document(s)

Reply to Missing Parts/
Incomplete ApplicationReply to Missing Parts
under 37 CFR 1.52 or 1.53

Drawing(s)



Licensing-related Papers



Petition

Petition to Convert to a
Provisional Application

Power of Attorney, Revocation



Change of Correspondence Address



Terminal Disclaimer



Request for Refund



CD, Number of CD(s) _____

☐ Landscape Table on CD

After Allowance Communication to TC

Appeal Communication to Board
of Appeals and InterferencesAppeal Communication to TC
(Appeal Notice, Brief, Reply Brief)

Proprietary Information



Status Letter

Other Enclosure(s) (please identify
below):

Remarks

Response to office action

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name

Signature

Urbain A. von der Embse

Printed name

Urbain A. von der Embse

Date

30 June 2005

Reg. No.

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature

Urbain A. von der Embse

Typed or printed name

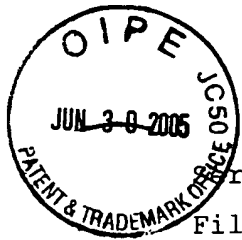
Urbain A. von der Embse

Date

30 June 2005

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



Serial No. 09/826,118
Filing date 01/09/2001
Name Urbain A. von der Embse
Unit 2124
Examiner Chat C. Do

06/30/2005

DETAILED ACTION RESPONSE


The attached patent application with all of your recommended changes was sent to you by Dec. 9, 2004 according to the enclosed copies of the certified mail receipts and the dates on the patent software in my PC. In response to your recommended changes mailed to me earlier on 03/24/05 and supported by the software dates the amended patent application was mailed earlier on June 19, 2004 and the mailing on Dec. 9, 2004 was a follow-up action response. My comments on the patent software on 5/18/04 and 5/19/04 that is resident in my PC are current since I have lost the original comments.

Attached are:

- 1) PTO/SB/21 Transmittal form
- 2) Dec. 9, 2004 certified mail receipt
- 3) June 19, 2004 certified mail transmit copy of receipt
- 4) Photo copy of 5/18/04 and 5/19/04 patent software on my PC
for the multi-resolution Wavelet (mrW_xxx) patent
elements xxx = abstract, claims, patent, et. al.
- 5) 03/25/04 office action requirements
- 6) Response to your office actions
- 7) Amended specification for the utility patent application

I hope that this information will be satisfactory and I sincerely appreciate your help and guidance with this patent application.

Contact No. 310.641.0488
Address Urbain A. von der Embse
7323 W. 85th St.
Westchester, CA 90045-2444

Signature 
Name Urbain A. von der Embse

Serial No. 09/826,118

2) Dec. 9, 2004 certified mail receipt

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PS Form 3800, June 2002 See Reverse for Instructions

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SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY
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1. Article Addressed to: <i>Attn: Chat C. Do</i> <i>Mail Stop Patent Applications</i> <i>Commissioner for Patents</i> <i>P.O. Box 1450</i> <i>Alexandria, VA 22312-1450</i>	B. Received by: (Printed Name) <i>Chat C. Do</i> C. Date of Delivery <i>DEC 6 1 030</i>
2. Article Number (Transfer from service label) 7003 3110 0000 4523 4937	D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No
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Serial No. 09/826,118

3) June 19, 2004 certified mail transmit copy of receipt

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Serial No. 09/826,118

- 4) Photo copy of 5/18/04 and 5/19/04 patent software on my PC
for the multi-resolution Wavelet (mrW_xxx) patent elements
xxx = abstract, claims, patent, et. al.

Attached is an inkjet copy of a digital camera photograph
of my PC screen for the multi-resolution Wavelet folder
listing the patent software mrW_xxx dated 5/18/04 and
5/18/04 for the software:

mrW_abstract	= abstract of the patent
mrW_claims	= claims
mrW_dist	= compact disc reference material
mrW_fed_ir&d	= federally sponsored research or development
mrW_figures	= drawings and performance data
mrW_org	= organization of the specifications
mrW_patent	= invention
mrW_references	= cross-reference to related applications
mrW_sequence	= sequence listing
mrW_title	= title of the invention

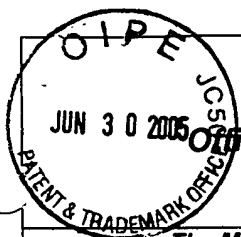
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	Size	Type	Modified
miw_abstract	20 KB	Microsoft Word Doc	5/18/04 9:07 PM
miw_claims	2 KB	Microsoft Word Doc	5/19/04 3:12 PM
miw_disc	1 KB	Microsoft Word Doc	5/18/04 9:22 PM
miw_led_1kd	1 KB	Microsoft Word Doc	5/18/04 9:25 PM
miw_figures	2,5 KB	Microsoft PowerPoint	5/18/04 7:43 PM
miw_00g	2 KB	Microsoft Word Doc	12/15/04 7:15 PM
miw_patent	2 KB	Microsoft Word Doc	5/18/04 8:05 PM
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miw_summary	1 KB	Microsoft Word Doc	5/18/04 9:17 PM
miw_title	2 KB	Microsoft Word Doc	5/18/04 9:31 PM
miw_abstract	2 KB	Microsoft Word Doc	12/15/04 7:40 PM

Serial No. 09/826,118

5) 03/25/04 office action requirements

Attached is a copy of your 11 page office action sent on
03/25/04.



Office Action Summary

Application No.	Applicant(s)	
09/826,118	VON DER EMBSE, URBAIN ALFRED	
Examiner	Art Unit	
Chat C. Do	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/09/01;6/14/01;7/23/01;9/13/01;10/18/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations cited in claims 1-6 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or ~~corrected drawings~~ are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Color photographs and color drawings are acceptable only for examination purposes unless a petition filed under 37 CFR 1.84(a)(2) is granted permitting their use as acceptable drawings. In the event that applicant wishes to use the drawings currently on file as acceptable drawings, a petition must be filed for acceptance of the color photographs or color drawings as acceptable drawings. Any such petition must be accompanied by the appropriate fee set forth in

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37 CFR 1.17(h), three sets of color drawings or color photographs, as appropriate, and, unless already present, an amendment to include the following language as the first paragraph of the brief description of the drawings section of the specification:

The patent or application file contains at least one drawing executed in color. Copies of this patent or patent application publication with color drawing(s) will be provided by the Office upon request and payment of the necessary fee.

Color photographs will be accepted if the conditions for accepting color drawings have been satisfied.

Specification

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

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5. The abstract of the disclosure is objected to because there is a duplicated abstract in the specification. Correction is required. See MPEP § 608.01(b).

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

6. The disclosure is objected to because of the following informalities: there is a duplicate set of claims in the specification.

Appropriate correction is required.

Claim Objections

7. Claims 1-3 are objected to because of the following informalities:

Re claims 1-2, there is missing a period (.) at the end of claims 1-2. In addition, there must be either comma (,) or semi-comma (;) in between each cited limitations (e.g. provide extensions of the Wavelet concept to the Fourier domain or equivalently the frequency domain; provide single waveform designs for all of the waveforms at multiple scales...).

Re claim 2, the phrase "the t-f space" should be rewritten as "the time-frequency space" in line 3. The term "c" in line 13 should be removed.

Re claim 3, there are two periods (.) in the claim. The applicant is advised to remove one period (.).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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The specification fails to address clearly and precisely how to design multi-resolution waveforms and filters in Fourier domain with a property which provide a single waveform design for all of the waveforms at multiple scales in a way as to enable one skilled in the art to make the invention.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. ~~Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.~~

Re claim 1:

The word "means" is preceded by the word(s) "the design" in line 1 in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element, as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

There are limitations (e.g. the design, the Fourier domain, the frequency domain...) that lack antecedent basis.

The limitations cited in lines 1-2 are unclear whether they mean a method or an apparatus to design a new single multi-resolution waveform and filter in a Fourier domain comprising or to design new multi-resolution waveforms and filters in a Fourier domain with properties.

The term "can" in line 10 is a relative term which renders the claim indefinite.

The term "can" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 1 provides for the use (the properties) of the multi-resolution waveforms and filters, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass.

A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 1 is rejected under 35 U.S.C. 101 because the claimed recitation of a use (the properties), without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

In addition, claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps/structural, such omission amounting to a gap between the steps/structural. See MPEP § 2172.01.

For examination purposes, ~~the examiner considers claim 1 as an apparatus means to design a multi-resolution waveform and filter in frequency domain (Fourier domain).~~

Re claim 2:

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Claim 2 has similar problems as clearly cited in claim 1 above. For examination purposes, the examiner considers the claim 2 as an apparatus means to design a multi-resolution waveform and filter in the frequency domain.

Re claim 3:

Claim 3 has similar problems as clearly cited in claim 1 above. In addition, it is improper to claim features, which refers by number as cited in line 3. For examination purposes, the examiner considers the claim 3 as a method for designing a multi-resolution waveform, which allows Fourier domain techniques to be used.

Re claims 4-5:

Claims 4-5 have similar problems as clearly cited in claim 1 above.

Re claim 6:

Claim 6 has similar problems as clearly cited in claim 1 above. In addition, it is indefinite by the limitations "a new formulation in (5)" in line 1 and "the dc multi-resolution" in line 2.

In general, claims 1-6 have many limitations being indefinite for failing to clearly point out and distinctly claim the subject matter.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 2124

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hajj et al. (U.S. 6,064,768).

Re claim 1, Hajj et al. disclose in Figure 1 an apparatus means to design a multi-resolution waveform and filter in frequency domain (Fourier domain).

Re claim 2, Hajj et al. disclose in Figure 1 an apparatus means to design a multi-resolution waveform and filter in the frequency domain (Figure 2).

Re claim 3, Hajj et al. disclose in Figure 1 a method for designing a multi-resolution waveform, which allows Fourier domain techniques to be used.

Re claim 4, Hajj et al. disclose in Figure 1 a method for the design of multi-resolution waveforms which can incorporate Fourier domain techniques into design methodologies which can include analytical and iterated filter bank construction design techniques (16 and 20).

Re claim 5, Hajj et al. disclose in Figure 1 a method for the analysis (16 and 20) and design of multi-resolution waveforms using Fourier domain techniques which take advantage of the new invention disclosures on the characterization and design of multi-resolution waveforms in the Fourier domain.

14. Claim 6 is rejected under 35 U.S.C. 102(b) as being anticipate by the admitted prior art.

Re claim 6, the admitted prior art discloses in the background of invention of the present invention a new formulation in (5) for multi-resolution waveform as a function of the dc multi-resolution waveform (page 7 last paragraph to page 8 first paragraph) which adds the concept of a frequency index that allows the multi-resolution waveform to be place arbitrarily throughout the t-f space thereby 1) avoiding the restrictions of the Wavelet iterated filter construction for tiling a t-f space, and 2) allowing the new multi-resolution waveforms to be used for multi-resolution communications and for bandwidth-on-demand communications application in place of traditional Wavelets.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
 - a. U.S. Patent No. 6,687,422 to Chen et al. disclose a discrete image data interpolation using sub-unity shift.
 - b. U.S. Patent No. 6,643,406 to Hajjahmad et al. disclose a method and apparatus for performing linear filtering in wavelet based domain.
 - c. U.S. Patent No. 6,584,111 to Aweya et al. disclose an ABR flow control using single bit congestion indication and wavelet transform filtering.
16. An examination of this application reveals that applicant is unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed.

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Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

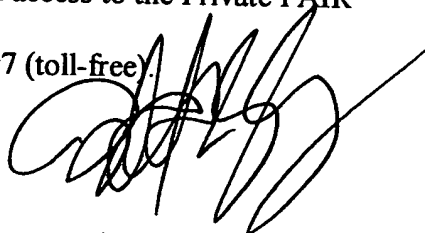
Applicant is advised of the availability of the publication "Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office." This publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (703) 305-5655. The examiner can normally be reached on M => F from 7:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaki Kakali can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2124


TODD INGBERG
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Serial No. 09/826,118

6) Response to your office actions

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Detailed Action 1. Information Disclosure Statement

The listing of references is in the separate paper Cross-Reference to Related Applications.

Detailed Action 2. Drawings

FIG. 5 is a Matlab code listing that replaces the original FIG. 5 with a representative algorithm of this invention that was used to derive the performance in FIG. 6 and which clearly describes to the reader the derivation and application of the algorithm.

Detailed Action 3. Drawings

FIG. 1-4,6,7 have their shading removed and FIG. 8 has the coloring removed.

Detailed Action 4. Specification

The abstract has been corrected.

The SPECIFICATION has been re-arranged following your guidelines.

Detailed Action 6. Disclosure

The duplicate set of claims has been eliminated.

Detailed Action 7. Claims

The claim objections have been corrected in the rewrite.

Detailed Action 8. Claims

The FIG. 5 listing of the Matlab 5.0 algorithm to calculate the multi-resolution Wavelet filter response in FIG. 6 is a complete, clear, concise, and exact documentation of a preferred implementation of the algorithm disclosed in this invention and which enables any person skilled in the art to apply this invention.

Detailed Action 9. Claims

The claims 1-6 have been corrected and FIG. 5 in the specification together with the disclosure of the invention clearly and concisely describes the subject matter referenced in claims 1-6. FIG. 5 is a listing of the Matlab 5.0 software used to design the single waveform for FIG. 6. Also included is the software that enables the waveforms for all scales and translations in both time and frequency to be generated by the frequency design coordinates for the single waveform.

Detailed Action 10. Claims

I believe the rewrite of claims 1-6 points out and distinctly claims the subject matter which is the invention.

Detailed Action 11. Claims

Claim 1-6 corrections have been made.

Detailed Action 12. Claims

The multi-resolution Wavelet waveform design described in claims 1-6 of this invention disclosure is a novel and unique method for designing Wavelet waveforms and was never described or patented or disclosed in prior publications.

Detailed Action 13. Claims 1-5

Hajj et. al. uses an iterated filter construction for generating Wavelet filters at different scales from a single Wavelet. This iterated filter construction is clearly described in FIG. 1,2 and in the supporting text in section II Description of the Related Art in the section BACKGROUND OF THE INVENTION. However, Hajj et. al. do not disclose a method for the construction of the mother Wavelet to start this iterated filter construction, to meet specific communications and radar requirements.

In contrast, the invention develops a unique and novel method for the custom design of a mother Wavelet in both time and frequency to meet requirements for communications and for radar, and the frequency design coordinates for this mother Wavelet directly generate Wavelets for arbitrary scale, time translation, and frequency translation parameters thereby avoiding the computational complexity and restrictions on the iterated filter construction.

Claims 1-6 have been rewritten to clearly identify the novel elements of this invention. Together with the above comments on Hajj et. al. and the iterated filter bank construction and on the invention disclosure, this should be sufficient to support the acceptance of these claims.

Detailed Action 14. Claim 6

Equation (5) and page 7 last paragraph and page 8 first paragraph in the BACKGROUND OF THE INVENTION are the equations for an iterated filter construction using scaling functions and Wavelets. The resulting frequency filters in this current Wavelet art are uniformly spread over the frequency band.

However, this current construction of Wavelets cannot provide the properties disclosed in this invention which include

- 1) custom design of the mother Wavelet to meet requirements for communications and radar,
- 2) mother Wavelet is specified by a relatively few frequency design coordinates which remain invariant for scale, time translation, and frequency translation parameters,
- 3) frequency design coordinates of mother Wavelet easily generate Wavelets for arbitrary scale, time translation, and frequency translation parameters thereby avoiding both the complexity and the tiling limitations for uniform filter banks, and the
- 4) Wavelets are complex and include a frequency translation Parameter which are novel features.

Claim 6 has been re-written to clearly identify some of the the novel elements of this invention expressed in the above. Together with the above comments on the iterated filter bank construction and on the invention disclosure, this should be sufficient to support the acceptance of these claims.

Detailed Action 14. Conclusion

The listed prior art is included in the section CROSS-REFERENCE TO RELATED APPLICATIONS and does not impact this invention disclosure.

- a. The method of interpolation disclosed by Chen et. al. in U.S. Patent No. 6,687,422 performs a time shift of a digital image in the frequency domain as a phase shift. This demonstrates the time-frequency domain duality.
- b. An iterated filter technique is disclosed by Hajjahmad et. al. in U.S. Patent No. 6,643,406 to generate filters at different scales. This prior art is discussed in the section BACKGROUND OF THE INVENTION.
- c. Wavelet transform-based filtering technique is disclosed by Aweya et. al. in U.S. Patent No. 6,584,111,406 to measure the traffic congestion in an Asynchronous Transfer Mode (ATM) network for data flow control. This demonstrates the frequency selectivity of Wavelets.

Detailed Action 16. Conclusions

Your guidance, information, and recommendations are sincerely appreciated and are reflected in this amended patent application.

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7) Amended specifications for the utility patent application

The SPECIFICATION has been reorganized to meet the USPTO standards.

FIG. 5 in the DRAWINGS AND PERFORMANCE DATA has been replaced by a listing of the Matlab 5.0 software algorithm for the design of the filter impulse response in FIG. 6. Also, this listing includes a conversion algorithm for generating the Wavelet for all scale, time translation, and frequency translation parameters using the frequency design coordinates for the mother Wavelet.

Text describing FIG. 5 has been added to the DETAILED DESCRIPTION OF THE INVENTION on page 6 line 32 to page 7 line 5 and on page 26 line 24 to page 32 line 10.

The ABSTRACT has been corrected to meet the USPTO guidelines.

The CLAIMS have been corrected to meet the USPTO guidelines.

APPLICATION NO. 09/826,118

INVENTORS: Urbain Alfred von der Embse

TITLE OF THE INVENTION

~~New~~ Wavelet Multi-Resolution Waveforms



APPLICATION NO. 09/826,118

INVENTION: ~~New~~ Wavelet Multi-Resolution Waveforms

INVENTORS: Urbain Alfred von der Embse

CROSS-REFERENCE TO RELATED APPLICATIONS

U.S. PATENT DOCUMENTS

US-5,453,945	Sept 26 1995	Tucker et al.
US-5,526,446	June 11 1996	Adelson et al.
US-5,845,243	Dec 1 1998	Smart et al.
US-5,937,009	Aug 10 1999	Wong et al.
US-5,953,388	Sept 14 1999	Walnut et al.
US-6,064,768	May 16 2000	Hajj et al.
US-6,091,777	Jul 18 2000	Guetz et al.
US-6,182,035	Jan 30 2001	Mekuria
US-6,477,553	Nov 5 2002	Druck
US-6,584,111	June 24 2003	Aweya et al.
US-6,643,406	Nov 4 2003	Hajjahmad et al.
US-6,687,422	Feb 3 2004	Chen et al.

OTHER PUBLICATIONS

"A Computer Program for Designing Optimum FIR Linear Phase Filters' J.H. Mc.Clellan, T.W. Parks and L.R. Rabiner, IEEE Trans Audio Electroacoust. Vol. AU-21, Dec. 1973, pp. 506-526

"Eigenvalues: A New Approach to Least-Squares FIR Filter Design and Applications Including Nyquist Filters", P.P. Vaidyanathan and T.Q. Nguyen, IEEE Trans. on Circuits and Systems, Vo. CAS-34, No. 1, Jan. 1987, pp 11-23

"Wavelet Transform based Fast Approximate Fourier Transform", Haitao Guo, Sidney Burrus, 1997, IEEE, pp. 1973-1976

"A new design algorithm for two-band orthonormal rational filter banks and orthonormal rational Wavelets", T. Blu, IEEE Signal Processing, June 1998, pp. 1494-1504

"Optimum discrete Wavelet scaling and its application to delay and Doppler estimation", K.C. Ho and Y. T. Chan, IEEE Signal Processing, Sept. 1998, pp. 2285-2290

"Progressive Wavelet Correlation Using Fourier Analysis", Harold S. Stone, 01/1999 IEEE Transactions on Signal Processing Vol 47, No 1, pp 97-107 IEEE

"2-D and 1-D Multipaired Transforms: Frequency-Time Type Wavelets", Artyom M. Grigoryan, 02/2001 IEEE Transactions on Signal Processing , Vol. 49, No. 2, pages 344-353

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INVENTION: ~~New~~ Wavelet Multi-Resolution Waveforms

INVENTORS: Urbain Alfred von der Embse

STATEMENT REGARDING FEDERALLY SPONSORED
RESEARCH OR DEVELOPMENT

Not Applicable.



APPLICATION NO. 09/826,118
INVENTION: ~~New~~ Wavelet Multi-Resolution Waveforms
INVENTOR: Urbain Alfred von der Embse

DRAWINGS AND PERFORMANCE DATA

APPLICATION NO. 09/826,118

INVENTION: ~~New~~ Wavelet Multi-Resolution Waveforms

INVENTORS: Urbain Alfred von der Embse

INCORPORATION-BY-REFERENCE OF MATERIAL
SUBMITTED ON A COMPACT DISC

Not Applicable.